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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/003,044

12/06/2001

Hajime Matsumoto

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12/10/2003

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EXAMINER

PUTTLITZ, KARL J

ART UNIT

PAPER NUMBER

1621

DATE MAILED: 12/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/003,044

Applicant(s)

MATSUMOTO ET AL.

Examiner

Karl J. Puttlitz

Art Unit

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Response to Arguments/Amendments

The rejection under § 112, second paragraph is withdrawn in view of Applicant's amendments.

The outstanding rejection to claims 1-7 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,414,182 to Shingai et al. (Shingai) is maintained.

The invention is drawn to a process for producing hydroxyalkyl (meth)acrylate by reacting (meth)acrylic acid with alkylene oxide to produce the hydroxyalkyl (meth)acrylate, further comprising recovering unreacted (meth)acrylic acid by distillation and recycling the recovered (meth)acrylic acid as raw material for the reaction.

The remarks under § 103 made in the previous Office Action are incorporated herein by reference in their entirety. Specifically, Shingai teaches "an addition reaction between the carboxylic acid and the alkylene oxide is carried out in the presence of a catalyst." See column 2, lines 30-31.

Examples of the carboxylic acid usable in Shingai include "acrylic acid, methacrylic acid, acetic acid, propionic acid, butyric acid, maleic acid, fumaric acid, succinic acid, benzoic acid, terephthalic acid, trimellitic acid, and pyromellitic acid, but acrylic acid and methacrylic acid (which are generically referred to as (meth)acrylic acid) are particularly preferable. In addition, the alkylene oxide, usable in the present invention, preferably has 2 to 6 carbon atoms, more preferably 2 to 4 carbon atoms. Examples thereof include ethylene oxide, propylene oxide, and butylene oxide.

Among them, ethylene oxide and propylene oxide are preferable, and ethylene oxide is particularly preferable." See paragraph bridging columns 2 and 3.

Importantly, Shingai teaches recycling at recycling alkylene oxide or the carboxylic acid, either separately or together. Specifically, the references teaches that "raw carboxylic acid and the raw alkylene oxide into the reactor, they may be added from their separate lines, or they may be premixed together in such as piping, a line mixer, or a mixing tank and then added into the reactor. In addition, in the case where a reactor outlet liquid is circulated into a reactor inlet, or in the case where an unreacted residue of the alkylene oxide or carboxylic acid is recovered and then recycled, these liquids may be mixed with the raw carboxylic acid or the raw alkylene oxide and then added into the reactor. However, in the case where the raw carboxylic acid and the raw alkylene oxide are added from their separate feeding lines into the reaction liquid, the molar ratio in the reaction liquid is such that the carboxylic acid is excessive near an inlet into which the carboxylic acid is added, therefore it is preferable that the above raw materials are premixed together in such as piping and then added into the reactor." See column 3, lines 41-57.

Shingai also teaches purification of the final product by removal of the raw starting materials, e.g., by distillation: "[t]he conversion in this addition reaction is often less than 100%, therefore generally such as a portion of the carboxylic acid or alkylene oxide remains unreacted in the reaction at the end of the reaction. Thus, the above reaction liquid is led to the step to remove such as these unreacted residues of raw materials from the reaction liquid, and then purified by such as distillation as the

subsequent final step, with the result that the aimed hydroxyalkyl ester is obtained.”

See column 2, lines 30-40.

The difference between Shingai and the claimed inventions is that Shingai does not teach the invention with particularity so as to amount to anticipation (See M.P.E.P. § 2131: “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).).

In the context of obviousness, although the claimed invention may be encompassed by Shingai, this by itself does not render the invention obvious. *In re Baird*, 29 USPQ 2d 1550, 1552 (Fed. Cir. 1994). However, based on the above, Shingai teaches the elements of the claimed invention with sufficient guidance, particularity, and with a reasonable expectation of success, that the invention would be *prima facie* obvious to one of ordinary skill (the prior art reference teaches or suggests all the claim limitations with a reasonable expectation of success. See M.P.E.P. § 2143).

Applicant's arguments filed October 6, 2003 have been fully considered but they are not persuasive.

Specifically, Applicant argues that Shingai fails to teach or suggest a step of removing unreacted components such as methacrylic acid by distillation. See Response at page 5.

However, Shingai specifically teaches that "a portion of the carboxylic acid or alkylene oxide remains unreacted in the reaction at the end of the reaction. Thus, the above reaction liquid is led to the step to remove such as these unreacted residues of raw materials from the reaction liquid". The reference also specifically teaches that "the resultant crude hydroxyalkyl ester may further be purified. The purification method is not especially limited, but examples thereof include purification by distillation, specifically, distillation involving the use of such as conventional distillation columns or rectifying columns (e.g. packed columns, bubble cap columns, perforated-plate columns), but there is no especial limitation thereto." From these passages, one of ordinary skill would expect that at least portions of unreacted starting materials, including (meth)acrylic acid, would be separated from the reaction mixture during this step. In this regard, there is no evidence or comment of record showing that starting materials may not be recovered during this disclosed step. Otherwise, recovering starting materials during the disclosed distillation is within the motivation of those of ordinary skill.

In contrast to Applicant's remarks, Shingai teaches the claimed recycling. In this connection, the examiner again refers to column 3, lines 41-57, disclosing that "raw carboxylic acid and the raw alkylene oxide [are recycled] into the reactor, they may be added from their separate lines, or they may be premixed together in such as piping, a line mixer, or a mixing tank and then added into the reactor." Accordingly, Shingai renders this aspect of the claimed invention obvious.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

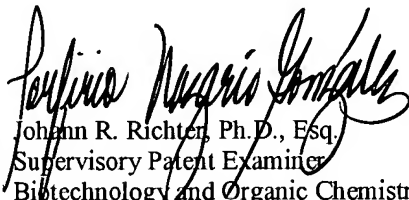
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (703) 306-5821. The examiner can normally be reached on Monday-Friday (alternate).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on (703) 308-4532. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1235.

Karl J. Puttlitz
Assistant Examiner

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